

GRC for a Unique Personal Weapon – the M203 Grenade Launcher

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ABSTRACT

The General Rifling Characteristics (GRC), of the M203 grenade launcher (6/R/3.9-4.2mm {0.153" – 0.165"}), have been measured and are given for future use by firearms examiners. Even though it does not fall under the definition of a "small arm", the fact it is operated as a personal weapon and is used in a civilian environment, makes this data very valuable. The measurements have been taken after a search of technical literature did not reveal any information about the width of the lands and grooves of this weapon.

Introduction

In the world of weapons, "small arms" are commonly defined as firearms of less than 20 mm caliber. These include pistols, revolvers, rifles, sub-machine guns, machine guns, etc. Weapons from 20 mm and above are considered as "cannons".

As always, there are exceptions to the "rule" and one of these exceptions is the M203 grenade launcher, which fires 40 mm projectiles.

The M203 was designed as a military weapon. As such, it was possible to see it as a "stand-alone" weapon (seen in the movies *Red* and *The Losers*) or as an attachment to various personal weapons, such as assault rifles. A most familiar application is the Colt M16 in all its variants, such as the M4. (Figure 1)

Even though the M203 has been in service since 1969, due to its simple, robust design, (Figure 2) it is still used today and has been adapted to modern firearms, such as the Israeli Tavor assault rifle. (Figure 3)

In spite of its original designation for military use, it is possible to see it today operating in urban areas. Soldiers serving in such areas all around the world in places such as Iraq, Afghanistan and the West Bank, take advantage of its versatility and use it to fire tear gas grenades, rubber bullets and other non-lethal munitions as well as lethal ammunition when necessary.

The use of the M203, in urban areas, sometimes causes damage to civilians' property and may even cause fatal injuries. In such cases, a firearms examiner may be asked to investigate the incident. In order to do so, the examiner needs to know



Figure 1: M203 attached to Colt M16



Figure 2: M203 Grenade Launcher



Figure 3: M203 attached to Israeli Tavor Assault Rifle

and recognize the General Rifling Characteristics (GRC) of the weapon.

One of the biggest problems in the identification of projectiles fired by the M203 is the fact they usually explode and fragment into small pieces. However, sometimes the examiner may be fortunate enough to receive a fragment with identifiable marks on it. (Figure 4)

The fragment shown in Figure 4 was received during a civil lawsuit of a Palestinian citizen against the Israeli Army. It was found, together with many 5.56X45mm and 7.62X39mm bullets, in his clinic. Beside the unusual width of the land mark, which measured 4.2mm (0.165") and had striation marks inside, another lead to the suspicion of it being a fragment from a 37/40 mm grenade was the material of the fragment, namely some kind of aluminum alloy. The lack of information about the GRC of the M203 grenade launcher led to this paper.

The fragmentation of the projectiles also makes it difficult to fire and collect samples for measuring purposes. Even training projectiles, which contain no explosives, are made of plaster and shatter completely on impact.

This leaves two ways of measuring the lands' width:

- Direct measurement at the muzzle, which has been done for this paper.
- RTV silicon casting and measurement of the lands' marks

from the cast.

GRC Measurements

Measurements at the barrels of two M203 launchers yielded a land width range of 3.9mm to 4.2mm (0.153" – 0.165"). These measurements coincided with measurements received by the courtesy of AFTE member Mr. William Cox.

To summarize the results, we can now define the GRC of the M203 grenade launcher as:

Projectile diameter – 40.7mm (1.602").

6 - lands and grooves.

Right hand twist.

Land width range - 3.9mm - 4.2mm (0.153" – 0.165").

Groove width range – 17.1mm – 17.4mm (0.673" – 0.685"). (Calculated)

And in short – 6/R/3.9-4.2mm or 6/R/.153"-.165".

The author of this paper hopes that it will assist fellow firearms examiners if and when they encounter projectiles or fragments with these GRCs.

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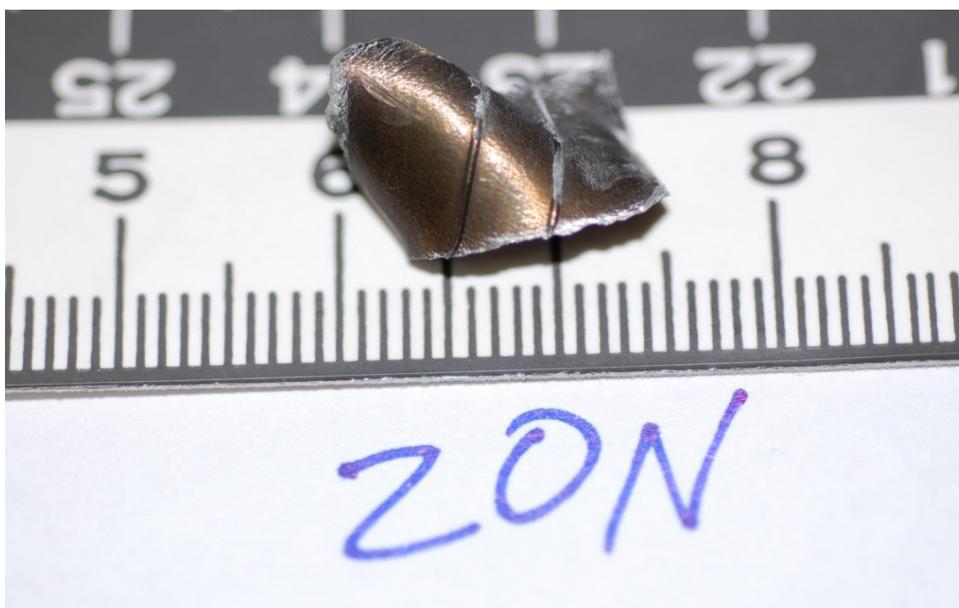


Figure 4: Grenade Fragment